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Beaglebone Guide: Toggle user LED on the Beaglebone

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February 15, 2013

Abstract

In this guide, I will describe how to toggle an user LED on the Beaglebone step by step. This guide targets beginners who are just getting started on the Beaglebone.

Specifications

Processor

- 720MHz super-scalar ARM Cortex-A8 (armv7a)
- 3D graphics accelerator ARM Cortex-M3 for power management
- 2x Programmable Realtime Unit 32-bit RISC CPUs

Connectivity

- USB client: power, debug and device
- USB host
- Ethernet
- 2x 46 pin headers 2x I2C, 5x UART, I2S, SPI, CAN, 66x 3.3V GPIO, 7x ADC

Software

- 4GB microSD card with Angstrom Distribution
- Cloud9 IDE on Node.JS with Bonescript library

Contents of the box

When you purchase a Beaglebone, you get the following items in the box as shown in Figure -1:

1. Beaglebone
2. USB cable
3. 4gb micro sd card



Figure-1: Box contents

User LED on the Beaglebone

There are a total of four user LED(s) on the Beaglebone. Figure -2 shows the different user LED(s) available on the beaglebone.

The user LED(s) are accessible from user space on the file system at this location:

```
/sys/class/leds/
```

There is one directory per user LED, named as shown below:

```
/sys/class/leds/beaglebone::usr0/  
/sys/class/leds/beaglebone::usr1/  
/sys/class/leds/beaglebone::usr2/  
/sys/class/leds/beaglebone::usr3/
```

Inside each one of those directories, there is a file named "brightness". If you write a "1" or a "0" to this file, then you can control the status of that led, i.e., toggle it ON or OFF respectively.

Note:- Since, User LED 0 is already in use to indicate Ethernet activity, you should use the remaining LED(s) for your projects.



Figure-2: USER LED(s) on the Beaglebone

Steps

For the purpose of this guide, I have used an Ubuntu 12.04 64 bit system.

- To power up the beaglebone, connect it to the computer via the usb cable as shown in the Figure -3:

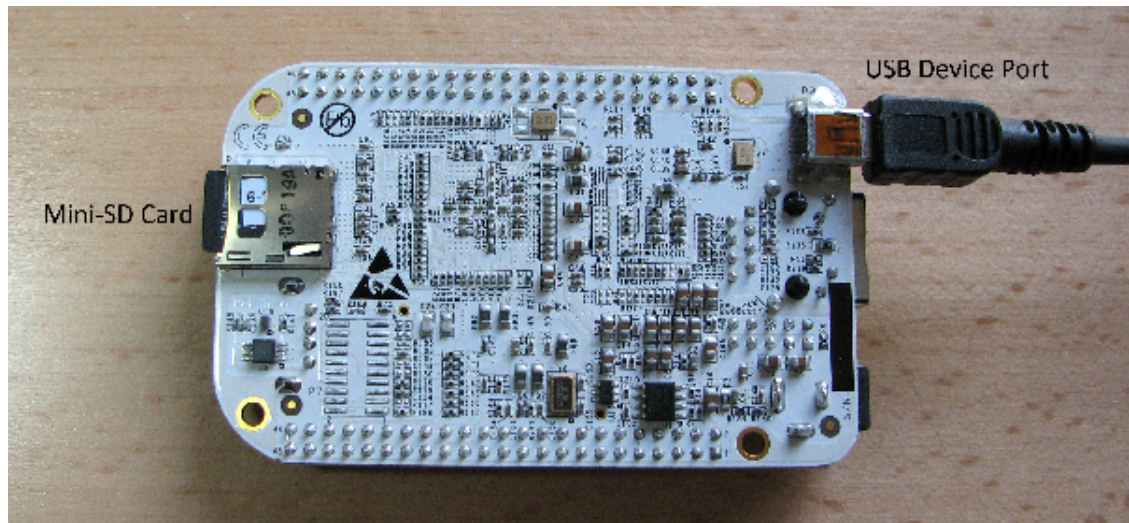


Figure-3: Powering up the Beaglebone

- Eject the Beaglebone via the disk utility program in Ubuntu. I tried ejecting it via the file manager but that did not work for me. Upon every boot, the Beaglebone is the “storage mode” by default. Hence, this step is done to switch it to “network mode”.
- Access the beaglebone via the terminal:

```
$ screen /dev/ttyUSB1 115200
```

Note:- You can also use minicom. But this is just much easier! Also in most cases the virtual USB serial port is ttyUSB1. If it does not work, try ttyUSB0 .

- You should be greeted by an Angstrom login. The username for the same is 'root' and for password, just press 'ENTER'. You should see the following prompt:

```
root@beaglebone:~ #
```

- Make sure that your kernel supports GPIO by typing the following commands in the terminal:

```
$ grep GPIOLIB /boot/config-`uname -r`
```

The output after running the above command should be as shown below:

```
CONFIG_ARCH_REQUIRE_GPIOLIB=y
CONFIG_GPIOLIB=y
```

Now run the following command in the terminal:

```
$ grep GPIO_SYSFS /boot/config-`uname -r`
```

The output after running the above command should be as shown below:

```
CONFIG_GPIO_SYSFS=y
```

- Now let us light that LED!

Write the following commands in your terminal(First one is for turning ON and latter for OFF):

```
echo 1 > /sys/class/leds/beaglebone::usr3/brightness
echo 0 > /sys/class/leds/beaglebone::usr3/brightness
```

You should get the output as shown below:

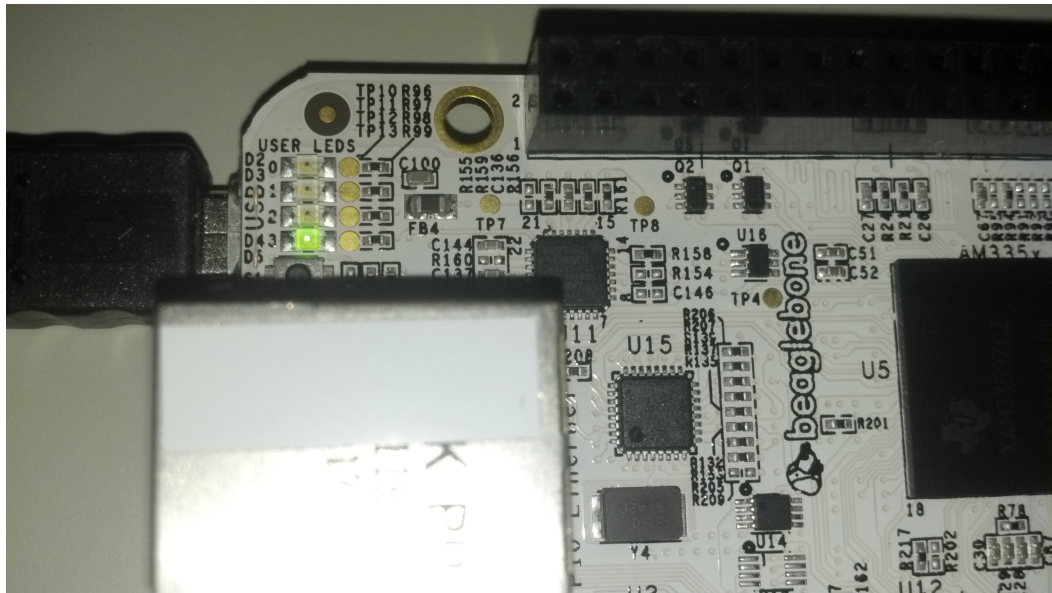


Figure-4: Led ON

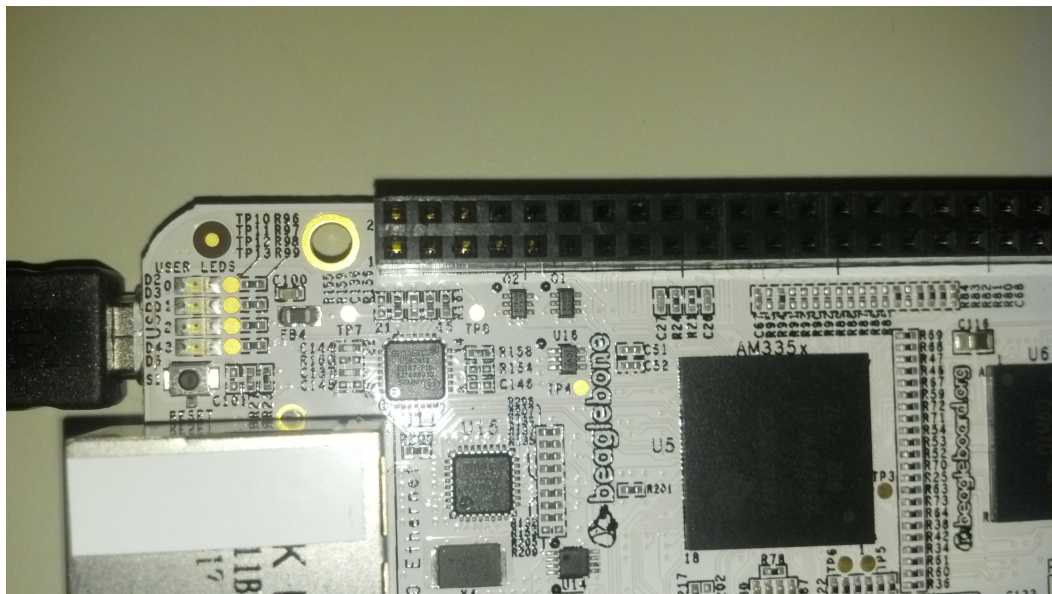


Figure-5: Led OFF